

# NITRIDE HETEROJUNCTION TRANSISTORS HAVING CHARGE-TRANSFER INDUCED ENERGY BARRIERS AND METHODS OF FABRICATING THE SAME

## ABSTRACT OF THE DISCLOSURE

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A nitride-based field effect transistor includes a substrate, a channel layer comprising InAlGa<sub>N</sub> formed on the substrate, source and drain ohmic contacts in electrical communication with the channel layer, and a gate contact formed on the channel layer. At least one energy barrier opposes movement of carriers away from the channel layer. The  
10 energy barrier may comprise an electron source layer in proximity with a hole source layer which generate an associated electric field directed away from the channel. An energy barrier according to some embodiments may provide a built-in potential barrier in excess of about 0.5 eV. Method embodiments are also disclosed.